

Clean Version of Claims

1. A thermoplastic composition formed from the melt blending of
 - a. A primary thermoplastic crystalline polymer present in the amount of 60 to 99 weight percent.
 - b. A secondary elastomeric polymer present in the amount of 1 to 40 weight percent.
 - c. An isocyanate or epoxy compound present in the amount of 0.1 to 3.0 percent based on the weight of the primary thermoplastic crystalline polymer.
 - d. A catalyst present in the amount of 0.001 to 5.0 percent based on the weight of the primary thermoplastic crystalline polymer.
2. The composition of claim 1 wherein an interpenetrating network is created with said thermoplastic composition.
3. The composition of claim 1 wherein said blending results in the formation of at least one interpenetrating network within said thermoplastic composition.
4. The composition of claim 1 wherein said secondary polymer is compatible for blending with said primary thermoplastic crystalline polymer.
5. The composition of claim 1 wherein said components are dynamically blended.
6. The composition of claim 1 wherein said components are not dynamically blended.
7. The composition of claim 1 wherein said secondary elastomeric polymer is dissimilar to said primary thermoplastic crystalline polymer.
8. The composition of claim 1 wherein said primary thermoplastic crystalline polymer is polyethylene terephthalate.
9. The composition of claim 8 wherein an interpenetrating network is created within said thermoplastic composition.
10. The composition of claim 1 where the primary thermoplastic crystalline polymer may be composed of several polymer types or mixtures such as would occur in using a recycled source of polymer.
11. The composition of claim 1 wherein said catalyst is compounded into said secondary polymer in advance of blending.
12. The composition of claim 1 wherein said isocyanate compound is methylenediphenylene diisocyanate ("MDI").

13. The composition of claim 1 wherein the number of isocyanate or epoxy compounds is one.

14. The composition of claim 1 wherein the number of isocyanate or epoxy compounds is more than one.

15. The composition of claim 1 further comprising at least one heat stabilizer component.

16. The composition of claim 1 wherein said at least one catalyst is selected from the group: dibutyltin dilaurate, maleate, precursors for phenolic resin, urea, melamine, dioctyltin dilaurate, sulphuric acid, sodium acetate, zinc chloride, carbomide, 5-phenyltetrazole, tert-butyl peroxy 2-ethylhexyl carbonate, tert-butyl peroxy-3,5,5-trimethylhexanoate, 2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane, tert-butyl peroxybenzoate.

17. The composition of claim 1 wherein the number of catalysts is one.

18. The composition of claim 1 wherein the number of catalysts is more than one.

19. The composition of claim 1 wherein said isocyanate is selected from the group: 4,4'-phenylmethane diisocyanate (MDI), polymethylene polyphenyl, polyisocyanate (PAPI).

20. The composition of claim 1 wherein said epoxy is selected from the group: phenols, bisphenols, aromatic epoxy resin and cycloaliphatic epoxy resin.

21. The composition of claim 1 wherein the melt temperature is sufficient to ensure at least two phases have 3-dimensional spatial continuity resulting from the dynamic curing in the presence of said catalyst.

22. The composition of claim 1 wherein said first polymer is from a scrap source.

23. The composition of claim 1 further comprising the addition of at least one of the following additives during blending: antioxidants, stabilizers, dyes, flame-retardants, extenders, UV stabilizers and processing aids.

24. The composition of claim 1 wherein said melt blending is performed in an extruder.

25. The composition of claim 1 wherein said melt blending is performed in an application unit.

26. The composition of claim 1 wherein the application unit is an injection molder.

27. The composition of claim 1 wherein said catalyst is present at a level of 0.001 to 10.0 weight percent, based on the weight of said first polymer.

28. The composition of claim 1 further comprising the addition of at least one additional heat stabilizer during the melt blending.